

Appl. No. 09/493,214

REMARKS

Claims 1-49 are now present in this application.

The Abstract, specification, and claims 1, 12, 19, 20, 21, 22, and 38 have been amended. Reconsideration of the application, as amended, is respectfully requested.

The Abstract stands objected to for certain informalities. Because these informalities have been addressed by the foregoing amendments, it is respectfully requested that this objection now be reconsidered and withdrawn.

The drawings stand objected to. Attached herewith is a corrected Fig. 1, which has been labeled "Background Art". It is respectfully requested that this new drawing be approved and that the objection to the drawing now be reconsidered and withdrawn.

In response to the PTO-948 Form, Notice of Draftsperson's Patent Drawing Review, attached hereto are also corrected sheets of Figs. 2-10. These sheets should have the proper margin and certain figures should be individually labeled. Also, the size of certain figures has been enlarged. Finally, the character of the line numbers and letters has been objected to in Figs. 9 and 10. However, it should be noted that these figures do not represent graphs, but a grating having a metal layer on the surfaces which are drawn with a thicker line. Therefore, it is intended that the lines are not uniformly thick, since this is supposed to illustrate

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the presence of the metal layer. It is respectfully submitted that Figs. 9 and 10 are appropriate. All drawings in the instant application should now comply with the U.S. Patent and Trademark Office's requirements, and all drawing objections should be withdrawn. Notification of approval of the drawings by the Examiner and the Official Draftsperson are respectfully requested.

Claim 22 stands rejected under 35 USC 112, second paragraph. This rejection is respectfully traversed.

In view of the foregoing amendments, it is respectfully submitted that claim 22 recites various method steps. As such, this 35 USC 112, second paragraph rejection should now be withdrawn.

Claims 23, 33-39 and 40-49 stand rejected under 35 USC 102(b) as being clearly anticipated by NAYA et al., European document 0 805 347 A2. This rejection is respectfully traversed.

In the NAYA et al. patent, a surface plasmon sensor is disclosed. Referring to Fig. 10, a transparent membrane 105 and a layer of electrically conducting material 110 is shown. Optical input and output means 106, 107 are positioned at exterior surface parts of the transparent member, and first and second diffractive optical elements 106, 107 are provided. However, NAYA et al. fails to disclose that the propagation directions of the optical light beams at the positions of the optical input and output means are essentially perpendicular to the exterior surface parts of the

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housing. In the surface plasmon sensor of NAYA et al., the light source may be rotated by a goniometer, such that the angles of incidence of the light beams upon the glass substrate and upon the metal film may take various values, as discussed in column 1, lines 21-24 of NAYA et al., for example. However, the angles of incidence shown in Fig. 10 of NAYA et al. are very far from normal incidence.

It is respectfully submitted that the surface plasmon resonance sensor of claim 23 is distinct from that of NAYA et al. It is known by persons skilled in the art that, in order to obtain a maximum coupling efficiency when using a grating as a coupling element, it is necessary to let the light beam be incident on the grating at an angle of incidence which is normally not perpendicular to the grating surface. Furthermore, it is not straightforward to produce a grating which is capable of diffracting the incoming light beam, coming in at normal incidence, in such a way that the diffracted light beam is incident on the electrically conducting layer at an angle at or near the surface plasmon resonance angle. Thus, the skilled person would be led to believe that it is not possible to produce a surface plasmon resonance sensor in which the light beam propagates substantially perpendicularly to the outer surface of the solid transparent member.

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It is a great advantage to have perpendicular propagation of the incident and the outgoing light beams, because alignment of an external light source (emitting the incident light beam) and an external detector (receiving the outgoing light beam) relative to the transparent member becomes uncritical, because coupling, e.g., between an external light source and the sensor according to the present invention, becomes less sensitive to vertical and horizontal displacements. For example, the distance from such a light source to the solid transparent member may easily be varied over a relatively large range. Similarly, vertical and horizontal displacements will not alter the position of the focal point at the sensing area. Accordingly, it is respectfully submitted that claim 23 is not obvious from the utilized prior art.

Regarding claim 40 of the present application, it is noted that, in Fig. 10 of NAYA et al., a surface plasmon resonator sensor is shown with a transparent member 105. Also, it is noted that a layer of electrically conducting material 110 is provided. First and second optical gratings 106, 107 are held by exterior surface parts of the transparent member and are adapted to direct the optical light beam towards/away from the electrically conducting layer.

However, as described above, NAYA et al. fails to disclose that the propagation directions of the optical light beams at the

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positions of the optical gratings are essentially perpendicular to the exterior surface parts of the transparent member. Furthermore, NAYA et al. fails to disclose that the received optical light beam and the re-emitted light beam are substantially collimated. In the description of NAYA et al. at column 20, line 38, lens 103 is described as a converging lens. Therefore, the incoming beam must necessarily be a focused beam and cannot possibly be a collimated beam.

It is therefore respectfully submitted that claim 40 sets forth a surface plasmon resonance sensor that is not suggested by the NAYA et al. reference. As outlined above, the prior art does not show the incoming and outgoing light beams propagated essentially perpendicularly to the exterior surfaces of the transparent member.

It is respectfully submitted that independent claims 23 and 40, as well as their dependent claims, would neither be suggested nor rendered obvious by the prior art utilized by the Examiner. Accordingly, it is respectfully requested that the 35 USC 102(b) rejection now be reconsidered and withdrawn.

Applicant gratefully acknowledges that the Examiner considers claims 1-21 to be allowable. Also, it is gratefully acknowledged that claims 24-32 are acknowledged as containing allowable subject matter. However, as set forth above, it is respectfully submitted

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that all claims now in the instant application should be in condition for allowance. Therefore, it is respectfully requested that all objections and rejections be withdrawn and an early Notice of Allowance be issued.

In the event that any outstanding matters remain in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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